

# Industrial Energy Efficiency Project

In order to introduce a structured approach to energy management in operation, Amreyah Cement Company has joined hands with the GEF funded project, "Industrial Energy Efficiency in Egypt". This project is implemented by the UNIDO in partnership with the Egyptian Environmental Affairs Agency, Ministry of Industry, Trade and SMEs and the Federation of Egyptian Industries. The project has helped Amreyah Cement Company to implement Energy Management System in alignment with ISO 50001 for an overall improvement in energy efficiency and improve environmental impact.

## EGYPT

### A Case Study of Amreyah Cement Company

#### Amreyah Cement Company Snapshot

**Industry:** Cement

**Location:** kilometer

55 Alexandria

Matrouh coastal road, Egypt

**Product:** Cement

**Implementation cost:** : ~0.25 MEGP

**EnMS Scope:** Electric & thermal energy

**Annual Energy savings:** ~105 GWh (2 year-plan)

**Financial savings:** ~47.4 MEGP

**GHG reduction:** ~78,168 Metric Tons CO<sub>2</sub>eq.

**Overall payback:** ~3 years

**Objectives period:** 3 years

**Time to implement EnMS:** 2 years

Amreyah Cement Company, founded in 1987, and currently has a production capacity of 5.5 million tons of cement per year out three production lines. In July 2012, the company was owned by the global Intercement group, which owns 40 factories around the world with a total production capacity of 46 mtpy.

Amreyah has an integrated management system, including ISO 9001, ISO 14001, ISO 18001 and soon ISO 50001.



#### Implementing EnMS in AMCC is the way out

Cement industry is one of the most affected sectors by the energy shortage and the lift of energy governmental subsidy. Consequently, Ameryah Cement Company, has been carefully following stringent measures to improve energy performance; hence improving the economics of production and the company environmental impact. The decision to implement EnMS, according to the guidelines of ISO 50001, provided the company the systematic approach to monitor and improve the energy performance throughout processes of production and maintenance within the cement plant.

#### AMCC ambitious EnMS objectives

In order to improve facility-wide energy performance, AMCC determined EnMS objectives based on identified opportunities for energy saving and energy efficiency improvement measures. In this context, the objective has been decided: to reduce electrical consumption by 10% and to reduce thermal consumption by 2%.

#### UNIDO, a key player in the plant's success

With UNIDO's support, AMCC staff were engaged in a thorough review and analyze of the company historic energy consumption and performance records. Then AMCC has developed an energy policy, defined the EnMS scope and boundaries and Baseline for each SEU. AMCC has focused on the identification of a medium term list of energy saving opportunities.

## Energy Saving Opportunities

Implemented Opportunities (In-progress)						
S	Implemented Energy Saving Opportunities	Elect Savings MWh	Fuel Savings MWh	Savings MEGP	Investment MEGP	Payback Year
1	Kiln 1: changing casing and cone of the ID fan; improving cooler fan flow; reducing by-pass fan speed by 20 rpm; reducing bag filter fan by 20 rpm	1,802		0.82	0.44	1.10
2	Kiln 1: Improving thermal energy consumption by 3% by changing main burner in addition to changing insulation, castable and refractory bricks in kiln and preheater		22,525	10.26	5.06	0.60
3	Kiln 3: Changing of insulation, castable and kiln bricks		48,839	22.16	6.72	0.40
4	Raw mills 1,2 & 5 : repair damaged mill seal (3%), hot gas ducts (3%), ball charge re-classification	3,598		1.63	1.08	1.60
5	Raw Mil 5: improving fan efficiency	383		0.19	0.15	0.78
6	Cement Mills 1, 2, 3, 4 & 5: using grinding aids	2,041		0.94	1.14	0.84
7	Cement Mills 3: installing adjustable flow diaphragm	1,865		0.85	1.80	2.10
<b>Total</b>		<b>9,688</b>	<b>71,364</b>	<b>36.81</b>	<b>16.39</b>	

Identified and Planned Opportunities						
S	Planned Energy Saving Opportunities	Elect Savings MWh	Fuel Savings MWh	Savings MEGP	Investment MEGP	Payback Year
1	Kiln 1: Power Factor correction	1,664		0.76	0.80	1.06
2	Kiln 1: PreheaterInstall Dip tube for Cyclone 3	0	6,628	3.01	1.96	0.65
3	Kiln 3: installing dip tube in Cyclone 3, improving cooler fan flow, decreasing cooler EP fan speed by 20 rpm and reducing bag filter fan speed by 20 rpm	982	7,254	3.43	1.17	0.82
4	Elimination of false air in RM circuits and installing disc valve to maneuver between silos	503		0.26	0.50	2.80
5	Cement Mills: disc valve for maneuvering between silos	2,483		1.11	1.00	0.89
6	Cement Mill 1 & 2: Improving Electrical consumption by 8% by Install adjustable flow diaphragm.	4,014		1.82	3.60	1.93
7	Cement Mill 4: Gear box _Install synthetic oil instead of mineral oil	485		0.22	0.08	0.34
<b>Total</b>		<b>10,131</b>	<b>13,882</b>	<b>10.60</b>	<b>9.11</b>	

### Barriers

During implementation of an EnMS, AMCC faced very few barriers and obstacles that were mainly:

- Resistance to change
- Staff were more concerned with production security than energy issues.
- Staff feeling that there is little room for energy performance improvement.

These were overcome by:

- Conducting awareness sessions
- Linking the EnMS with the environment and climate change scenario



### Lessons Learned

The implementation of the EnMS at AMCC has proven to be both easy and cost effective giving a strong management commitment and the availability of adequate technical resources. It has also proven that it is necessary to eliminate barriers between plant staff in different departments, thanks to cross-functional team building. Furthermore, EnMS helps to identify areas that have surplus of utilities against others that can use that surplus instead of producing more utilities.

### For more information:

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